

felt at Ardon, Canton Valais, on Tuesday, last week. A slight shock was felt at Geneva on Monday.

THE seven aeronautical ascents arranged for July 14 were made at Paris at 4 o'clock as contemplated. But it was impossible to make any of the scientific experiments which had been prepared, owing to the violence of the wind. One of the balloons exploded at 2000 feet, and the aeronauts were precipitated to the ground with terrific velocity, happily without any loss of life or injury of consequence. They were saved by a miracle, their car having been suspended in a gap between two houses. The catastrophe was produced by their imprudence, having placed their canvass in a net which was not quite large enough. The inferior part of the canvass being left unprotected exploded when it was filled by the expansion of the gas. This is a warning to aeronauts to place the right balloon in the right netting.

THE *Journal Officiel* publishes a table giving the exact number of public teachers in France; there are 32,463 females and 49,201 males. The salary of the largest number of them varies from 24*l.* to 100*l.*, only 198 females and 673 males having a salary of 100*l.* and upwards a year. Most of them receive pay of about 1*l.* per week. Under the present system their salaries involve an expense of little less than 3,000,000 sterling, and the Minister of Public Instruction refuses to propose any further increase under this head.

THE Belgian Academy offers a prize of 3000 francs for the best study of the subject of destruction of fishes by pollution of rivers. Four topics are specified—(1) What are the matters special to the principal industries, which, mixing with the water of small rivers, render them incompatible with the existence of fishes, and unfit for public supply, and for use by cattle? (2) A list of the rivers of Belgium, which are now "depopulated" by this state of things, with indication of the industries special to each of these rivers, and list of the edible fish that lived in them prior to the existence of those works. (3) Investigation and indication of practical means of purifying the waters at issue from the works, to render them compatible with the life of fishes, without compromising the industry, combining the resources which may be offered by construction of basins of decantation, filtering, and the use of chemical agents. (4) Separate experiments on the matters which in each special industry cause the death of fishes, and on the degree of resistance of each edible fish to destruction. Memoirs are to be sent in before October 1, 1884.

AN illustrated treatise on Coal-tar Distillation, by Prof. Lunge of Zurich, and an essay on the Noctuidæ of North America, by Mr. Grote, with colour d illustrations, will be the next contributions, respectively to technical science and natural history, issued by Mr. Van Voerst.

THE additions to the Zoological Society's Gardens during the past week include a ricoloured Lory (*Lorius tricolor*) from the Malay Archipelago, presented by Mr. H. Harraden; a Common Marmoset (*Leopale jachus*) from Brazil, presented by Mr. G. W. Drabble; sixty-one Restless Covies (*Cavia caprera*), British, presented by H.R.H. the Prince of Wales, K.G.; a Puff Adder (*Vipera arietans*) from South Africa, presented by Capt. Owen; a Heloderme Lizard (*Heloderma horridum*) from Mexico, presented by Sir John Lubbock, Bart., F.Z.S.; a Littoral Callichthys Fish (*Callichthys littoralis*) from Demerara, presented by Mr. George Little; a Bonnet Monkey (*Macacus radiatus*), a Macaque Monkey (*Macacus cynomolgus*) from India, a Levaillant's Cynictis (*Cynictis penicillata*) from West Africa, a Great Eagle Owl (*Bubo maximus*), European, deposited; a Black-fronted Teetee (*Callithrix nigrifrons*) from Brazil, a Black-faced Ibis (*Theristicus caudatus*) from South America, a Cedar Bird (*Ampelis cedrorum*), six Yellow-headed Troupials (*Xanthocephalus icterocephalus*) from

North America, a Kolb's Vulture (*Gyps kolbi*), a Sociable Vulture (*Vultur auricularis*) from Africa, two Ceylonese Hanging Parakeets (*Loriculus asiaticus*) from Ceylon, an Annulated Snake (*Leptodira annulata*) from Panama, purchased; a Turquoise Grass Parakeet (*Euphema pulchella*), a Geoffroy's Dove (*Peristera geoffroii*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

DAYLIGHT OBSERVATIONS OF WELLS' COMET.—At the Dudley Observatory, Albany, this comet was observed on the meridi in as early as June 5, just before noon, and again on June 11 and 12. The aperture of the object-glass of the transit-circle is 8 inches, the focal length of the telescope 10 feet. A detailed description, with engraving of the instrument with which these notable observations were made, will be found in vol. i. of the *Annals* of the Dudley Observatory. On June 5 the comet was not perceived until forty seconds after transit, and was observed with difficulty on a single wire, but the positions obtained on the subsequent dates were considered very satisfactory. The true nucleus was seen at the observation of June 11, made about sixteen hours after the perihelion passage, and the estimated diameter of the disc was 0".75. The nebulosity of the coma was uniform and faint about 10" in diameter. It is stated that "while the nucleus was observed for position, the coma was scarcely noticed at all." The atmospheric conditions on this day were such as are well known to conduce to easy vision of objects in daylight. "The sky was sparsely covered with cumulus clouds, while the intermediate clear spaces were exceedingly transparent." On June 12 the nebulosity had increased in brightness, but the image was very unsteady, and "either for that reason, or because of the increased brightness of the nebulous screen, the nucleus proper could not be seen." The very favourable observation on the preceding day gave the following apparent position of the comet:—

M.T. at Albany.		R.A.		Decl.	
h. m. s.		h. m. s.		°	' "
June 11, at 0 1 21.4	...	5 21 3.91	...	+19	9 17.6

This place agrees closely with that deduced from a parabolic orbit calculated by Mr. Wells, which will not be materially improved, without a discussion of the entire series of observations. The elements of this orbit are:—

Perihelion passage, June 10.53006 Greenwich M.T.

Longitude of perihelion...	...	53 55 46.4	} M.E. 1882.0
„ ascending node	...	204 56 16.8	
Inclination	...	73 48 32.3	
Logarithm of perihelion distance	...	8.7837199	

Motion—direct.

We are not aware that any complete observation of a comet on the meridian at noonday has been made since the year 1744. The grand comet in the early part of that year, first remarked by Klinkenberg at Harlem on December 9, 1743, attained an extraordinary degree of brilliancy towards the end of February. We find Bliss writing on February 12 (o.s.) to Lord Macclesfield, who had fitted up an observatory at Shirburn Castle, thus: "The comet appeared so very bright last night, equalling the light of Venus, that Dr. Bradley agrees that it may be seen on the meridian, and being engaged himself, has desired me to request your lordship to try to observe it. The elements which he left at Shirburn appear, to our last night's and former observations, to give the place true within 2' of longitude and latitude." As a matter of fact the comet was observed on the meridian near noon, at Shirburn on the 28th and 29th of February, and at Greenwich on the 29th; these observations will be found reduced in Mr. Hind's paper on the comet of 1744 (*Astron. Nach.* vol. xxvii.).

Mr. Lewis Boss, the director of the Dudley Observatory, is to be congratulated on his success in the case of the comet of the present year. Excepting the days of observation, none of the remaining dates from June 5 to June 18 were clear enough at the comet's meridian passage: otherwise it is evident that Mr. Boss would have secured a perfectly unique series of positions.

GEOGRAPHICAL NOTES

COREA has at last followed the example of China and Japan, and cautiously opened a door or two to the outside "barbarian." From time immemorial Corea has been hemmed in by exclusive-

ness, and shares with Tibet the honour of being among the least-known countries in the world. Now, however, that both England and the United States have persuaded the Koreans to throw open four of their ports to commerce, we hope that our ignorance of an interesting land will soon be dispelled. Corea is almost half the size of France, and its population is variously estimated at from nine to fifteen millions. M. Elisée Réclus, in his "Geographie Universelle," compares the peninsula to Italy. Like Italy, it has a mountain chain running down the centre of the country, and giving off lateral valleys; as in the Apennines, the gentlest slopes and most fertile valleys are in the west, while the east is more precipitous and barren. As with Italy, Corea has in the north-west an Alpine mass, which guards her from intrusion there, though the mass does not really cover all the boundary. Of the geology we know but little, though many valuable minerals, including coal, are supposed to abound, and the country as a whole is capable of great development with proper guidance and suitable machinery. We trust before the inevitable Europeanising process is complete, that accurate information on the habits and customs, language, and ethnology of the Koreans will be obtained.

In presence of the numerous and contradictory hypotheses as to the former geological history of the delta of the Amu-daria, it is obvious that no satisfactory scientific result as to the change of beds in the basins of the Amu and Syr-daria can be arrived at, without a thorough geological study of the different deposits of the rivers of the great Aral depression. A first step in this direction was made by the Amu-daria expedition; and now M. Hedroitz publishes, in the *Izvestia*, a valuable paper, giving the result of his researches in the same direction. Of course, one year is too short a time for thoroughly exploring this wide field; and M. Hedroitz's researches, however safe his method, and valuable his observations on the geological structure of alluvial deposits of different rivers of the Aral depression, on the motion of sand-dunes in the steppe, &c., are not yet sufficiently advanced to bring the author to a few general conclusions from his observations. His paper contains more valuable data than ready-made theories, and we hope that he will again return to the Amu to continue his researches. But one of his conclusions is worthy of notice. He does not admit that the Uzboy was a branch of the Amu-daria, as was admitted by the first explorers of this old bed. He supposes that there was a time (before the tenth century) when the Amu reached the Caspian, but by means of another bed which was situated south of the Sary-kamysh depression, leaving here the beds of "Amu-alluvium," which are seen in the lower parts of the Uzboy, but are missing in its upper parts. As to the Uzboy, it was but a temporary and irregular outflow of Lake Aral towards the Caspian, being rather a series of salt lakes and ponds, than a true river. Its name, Uz-boy (or "Uz-boyu," "along ponds"), would seem to confirm this hypothesis. The geological exploration would thus again call in question our established theories as to the former aspect of the Aralo Caspian basin.

HARTLEBEN, of Vienna, is issuing in parts a seventh German edition of Balbi's Universal Geography, under the editorship of Dr. Josef Chavanne, whose name is well-known as a scientific geographer and cartographer. Dr. Chavanne, to judge from the parts issued, is doing his work of editor conscientiously. In the mathematical and physical sections he seems to us to have brought the classical work abreast of the latest researches; and among the good points in the political geography are the statistics obtained at the recent censuses of 1881 and 1882, of all the leading countries of the world. While neither so detailed nor so picturesque as Réclus' "Geographie Universelle," the new edition of Balbi is perhaps more systematic and better adapted as a text-book, though it is published as a "house-book." With an exhaustive index the work will serve all the purposes of a succinct gazetteer.

THE leading article in *Petermann's Mittheilungen* for July is a long account of the unfortunate *Jeannette* expedition, with a map showing its drift from East Cape, north-west, to Bennett Island, and the route of the boats south-west to Lena mouth, after the loss of the vessel. The course of the expedition within two years was thus within very narrow limits, and the gains to science can be of comparatively small moment. A long letter from Dr. Emin-Bey describes his journey in the east of Bahr-el-Jebel, in March, April, and May of last year. Among the notes is a letter from Dr. Schweinfurth, describing the results of his journey in April and May this year, along the Nile above Siut,

for the purpose of collecting data for his map of the Nile valley; he gives some notes on the geology of the region.

THE following extract from a letter from Mr. W. Thomas, Meteorological Office Reporter at Scilly, to Mr. Robert H. Scott, F.R.S., Secretary to the Meteorological Council, has been sent us for publication:—"Scilly, July 14, 1882. I beg to inform you of a curious disturbance of the sea at 9 a.m. yesterday, July 13, about low water, the wind S.S.W. The water flowed rapidly up to 3 feet perpendicular, and then ebbed out again. It flowed and ebbed three times; the second and third time was not so high as the first. From the first to the last was about half an hour.

THE *Bolletino* of the Italian Geographical Society for May and June contains a detailed account of the work of the expedition under Capt. Cecchi in Shoa, with a map.

THE Danish Arctic Exploring Expedition under the command of Naval Lieut. Hovgaard, sailed on Tuesday on her expedition.

THE Geological Society of Stockholm has despatched an expedition to Spitzbergen, having for its special object the increase of our knowledge of the vegetable palæontology of the island.

BAROMETERS

THE subject is so old and well-worn that it is impossible to add anything new to it, still it is so large that there is no fear of its being exhausted by the few following notes. It will be going back quite far enough if we begin with Hook (*Phil. Trans.* i., 218, 1666), who invented the wheel barometer, and point out that his (1666) method consisted in using a mercury trough formed of two short open cylinders communicating near the bottom). Into one of these the lower end of the barometer tube was inserted while the float connected with the index rested on the mercury in the other. Derham (*Phil. Trans.* xx., 45, 1698), avoided the uncertainty caused by the float, cori, and index-bearings, and took his readings by means of a rod (terminating in a point) connected with the index by a rack and pinion. Gray (*Phil. Trans.* xx., 176, 1698) in the same year proposed the very method that is now in use for taking observations with the standard barometers, for he left the barometer tube free of all fittings and attachments, and read off the actual height of the mercurial column by means of a microscope (*sic*) sliding on a vertical scale. Fitzgerald (*Phil. Trans.* lii., 146, 1761) attached two movable indexes to the dial of the wheel barometer to show the highest and lowest points reached during any given period; and he also gave the float nearly the full range by having the upper part of the tube three inches in diameter, while the short upturned end was only half an inch diameter. In 1770 (*Phil. Trans.* lx., 74) he increased the range of the index by introducing a system of levers with arms of unequal length.

The earliest suggestion for increasing the sensitiveness of the barometer was made (1668) by Hook, who fixed over the mercury a narrow tube containing spirit. Descartes also proposed that same form of instrument which was made by Huyghens; but the uncertainty caused by the vapour-tension of the spirit rendered the readings so valueless that Huyghens (and this method was also claimed by De la Hire) connected the capillary tube with the shorter upturned end of the barometer, and thus did not interfere with the vacuum. Rowning employed the same principle, but bent the fine tube over, so that (though still parallel to) it was below the mercurial column; Hook's (*Phil. Trans.* xvi., 241, 1686) method of 1686 consisted in having enlargements at both surfaces of the mercury and another, open, over the capillary. Above the coloured spirit and water which came to a convenient height in the fine tube, he placed turpentine sufficient to partly fill the open enlargement. As the rise in the spirit-column was thus compensated (or nearly so) by the shortening of the turpentine column, it had no appreciable effect on the level of the mercury. The conical or pendant barometer of Amontons (1695) consists of a conical tube of very fine bore, containing the mercurial column, suspended with the wider end downwards. When the pressure of the air increases the mercury rises in the tube, but owing to the diminished diameter it occupies a greater length; when the pressure is less the column descends, until on reaching a wider part of the tube it is sufficiently shortened to restore equilibrium. Theoretically the range may be increased to any extent by having a tube of only